

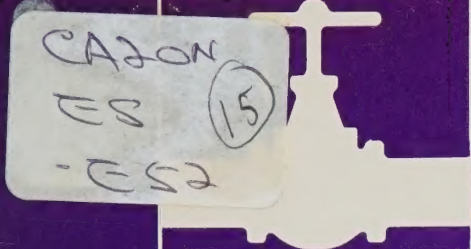
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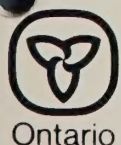
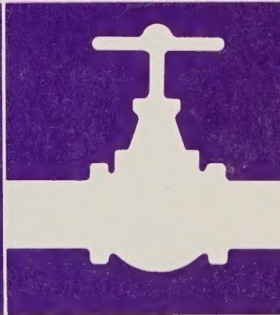




# Energy Efficiency in Municipalities:



## THE LAW



Ministry  
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Energy

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Ontario



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# **Energy Efficiency in Municipalities:**

## **THE LAW**

**A Ministry of Energy Discussion Paper**



Ontario

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of  
Energy



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## EXECUTIVE SUMMARY

"Energy Efficiency in Municipalities: The Law" is a partial catalogue of existing municipal legal powers available to promote energy conservation and renewable/recoverable energy use together with illustrations of their possible uses.

This discussion paper is intended primarily for municipal councillors and planning staff. It is also expected to be of interest to municipal solicitors, energy conscious developers, and citizen groups.

Municipalities in Ontario have many legal powers which can be used to increase the efficient use of energy in their communities, both through energy conservation and through increasing the use of renewable/recoverable energy sources. Although laws alone are not enough, they can make important contributions to a municipal energy program.

Because the energy needs and opportunities of each municipality differ, there are no simple, universal by-laws which all municipalities can adopt. Moreover, few municipalities have the technical or financial resources to tackle all issues at once. This paper is a partial catalogue of opportunities which can be selected and shaped as local circumstances require.

The municipal official plan is considered first. Official plan energy policies can focus municipal commitment on improved energy efficiency, set goals, and coordinate implementation strategies. A possible model for an official plan energy policy is included as an appendix.

Official plan energy policies can be implemented in a variety of ways. In the short-term, non-renewable transportation fuels can be conserved by encouraging greater use of car and van pools, bicycles, and public transit. Car and van pools and transit

can be made more convenient and attractive by reserved bus and car and van pool lanes, "park and ride" municipal parking lots, and preferential car and van pool parking, among others.

Improvements in the energy efficiency of existing buildings can be encouraged through the provision of appropriate technical information, and by the generous granting of zoning variances where required. Property tax increases triggered by energy-conserving improvements can be rebated, and obstacles to energy efficiency in existing by-laws can be removed. Property standards by-laws can probably also encourage buildings to be repaired and maintained at reasonable levels of energy efficiency, although material building alterations are governed only by the provincial Building Code.

Both infilling and redevelopment plans can improve the energy efficiency of existing urban areas, increasing the viability of transit and shortening trips to work and shopping.

Municipal powers are greatest in influencing new development. Although construction details, such as insulation, are governed solely by the province-wide Building Code, a great deal can be accomplished through external planning, such as street design, landscaping, orientation and building mix.

In general, medium density, mixed-use urban areas are likely to be the most energy-efficient. In such areas, buildings shelter each other reducing their space-heating needs; travel to work and shopping is minimized; and energy-efficient services, such as district heating and high levels of public transit, can be economically provided. Municipalities influence density and uses through their official plans and zoning by-laws.



Zoning by-laws can also be used to protect access to sunlight for both new and existing buildings, for example, by controlling building height, spacing, and orientation. Energy can also be conserved by innovations, such as cluster developments, keylotting and zero lot lines. These generally require amendments to zoning by laws.

Site plan by-laws can use some of the ancillary features of a development, such as landscaping, to improve its energy efficiency. For example, the windbreak provided by trees or fences can reduce building heat losses: summer shade of parking lots can reduce air conditioning loads on neighbouring buildings. Other energy conserving features can include pedestrian walkways, reduced flood-lighting, recycling depots, and berms (earth walls). In addition, shadow plotting in site plan drawings can alert both developers and planners to the shadows which will be cast by proposed buildings.

Subdivision approval and consents to convey land under The

Planning Act (s.29) can include conditions which conserve natural resources, including energy, or contribute to achieving energy policies in the official plan. These conditions can include narrow east-west streets, lot placement to maximize access to sunlight, and provision for future district heating systems, among others.

Under the new draft Planning Act, these powers will remain substantially unchanged. However, the provincial interest in the efficient supply and use of energy will be clarified.

Improvements in energy efficiency would have many benefits for Ontario residents. However, improving energy efficiency is not always easy, and is only one issue among many clamouring for municipal attention. While many implementation problems remain, this and other papers of the Ministry of Energy point the way for municipalities which wish to pioneer in this important field.

# ENERGY EFFICIENCY: A SUMMARY OF CURRENT MUNICIPAL POWERS

Power	Statutory Authority	Scope	Examples of Uses to Increase Energy Efficiency
Policies and Objectives: The Official Plan	s.12 Planning Act	General policies affecting pattern of physical development.	State municipal commitment to energy efficiency. Encourage compact, mixed-use development. Give priority to transit. Provide goals and framework for including energy considerations in by-laws.
Immediate Actions: Transportation			
Transit fare subsidies	s.354(1) par. 89, 90 Municipal Act	Municipally owned transit systems.	Encourage use of transit.
Establishment of "park and ride" parking lots	s.352 par. 72 Municipal Act	At convenient locations for transit.	Encourage use of transit.
Construction of bus shelters	s.354(1) par. 90 Municipal Act	Any municipality with bus service.	Encourage use of transit.
Establishment of carpool, bus, and bicycle lanes	s.354(1) par. 107 and s.460 par. 9,10 Municipal Act	Any municipal road. Municipally owned transit systems.	Encourage use of transit and high-occupancy vehicles by reducing travel time, especially during rush hour.



Establishment of reversible lanes	s.354(1) par. 107 Municipal Act	Primarily for roads with three or more lanes.	Smooths traffic, may provide room for high-occupancy vehicle lanes.
Preferential parking for high-occupancy vehicles	s.352 par. 72 Municipal Act	Municipally owned lots only.	Increases relative convenience and economy of car and van pools.
Reduction of on-street parking, especially during rush hours	s.354(1) par. 107 Municipal Act	Any municipal road, particularly where transit is available.	Decreases traffic congestion, increases relative convenience of transit.
Conversion of 4-way stops to 2-way stops or pedestrian crossings	s.460 par. 7 Municipal Act	Where consistent with other objectives, such as safety.	Smooths traffic.
Prohibition of leaving unattended vehicles unlocked	s.363 par. 8 Municipal Act	Does not apply to commercial vehicles.	Can minimize unnecessary idling.

# ENERGY EFFICIENCY: A SUMMARY OF CURRENT MUNICIPAL POWERS (Cont'd)

Power	Statutory Authority	Scope	Examples of Uses to Increase Energy Efficiency
Immediate Actions: Existing Buildings			
Rebates of property taxes	s.248(1) Municipal Act	Grants at discretion of Council.	Temporary rebate of increases due solely to retrofit of energy-conserving improvements.
Variances and Exemptions from Zoning	s.35,42 Planning Act	Minor variances granted by committee of adjustment. Exemptions granted by by-law.	Permit energy-conserving improvements (greenhouses, solar collectors, etc.) not to comply with coverage setback, and height restrictions in zoning by-laws. Permit infilling on both regular and substandard lots.
Preserve Access to Sunlight	s.35 Planning Act	Control height limits.	Minimize abrupt changes in height between adjacent areas so as to preserve existing access to sunlight. Encourage low and medium-rise multiple family housing instead of high-rises.



Minimum Temperature By-laws

s.354(1) par. 64  
Municipal Act

Rented dwellings in which heat  
is provided by the landlord.

Reduce minimum temperatures  
to 20°C during the day and  
18°C or less at night (12 p.m.  
to 6 a.m.).

Property Standards By-laws

s.36  
Planning Act

Municipalities with official  
plans or policy statements  
relating to property conditions.  
All buildings may be required  
to be repaired and maintained  
to prescribed standards.

Require furnaces to be operated  
at high efficiencies.\* Require  
external openings to be weather-  
tight.\* Prescribe maximum and  
minimum levels for mechanical  
heating, cooling and lighting.\*  
Make grants or loans to building  
owners for energy conserving  
improvements.\*

\* The suggested by-laws would be a substantial departure from current practice. While s.36 is worded broadly to include energy efficiency standards, it is currently used only to require minimum levels of safety and comfort, and to avoid the creation of nuisances. Courts may be reluctant to uphold property standards by-laws directed only at saving energy until wasting energy is perceived as harming society in general.

ENERGY EFFICIENCY: A SUMMARY OF CURRENT MUNICIPAL POWERS (Cont'd)

Power	Statutory Authority	Scope	Examples of Uses to Increase Energy Efficiency
Longer-Term Actions: New Development			
Zoning By-laws	s.35 Planning Act	Control height, location, spacing, density, frontage, external design, and use of new buildings.	Permit/require compact, mixed-use development. Preserve solar access for maximum number of buildings by controlling height, spacing, roof angle, etc., and permit innovative departures from standards for frontage, setbacks, etc., where necessary for solar access.
Site Plan By-laws	s.35a Planning Act	Municipalities with official plans only. Control landscaping, grading, walkways, and similar ancillary facilities in new developments in designated areas.	Provide windbreaks and summer shade through landscaping, grading. Regulate type of vegetation (mature height coniferous/deciduous) to protect solar access, especially in winter. Encourage alternatives to the auto by providing walkways. Provide recycling depots. Require plotting of shadows of commercial, industrial, and large residential buildings.
Parks	s.35a Planning Act	Municipality entitled to five per cent of new residential subdivisions for parks.	Site and landscape parks to provide access to sunlight, winter windbreaks, and bicycle paths.



Subdivision Approval

s.33  
Planning Act

All subdivision of land except by s.29 consent.  
Approvals granted by Minister of Housing except where delegated to municipalities (usually to regional municipalities).  
Must have regard to municipal official plan, even when approval granted by Minister or region.

Give preference to compact, mixed-use development.  
Orient streets east - west.  
Orient building within 30° of south.  
Locate lots so as to maximize solar access, e.g., street townhouse lots on south sides of east - west streets; large lots and key-shaped lots on north - south streets.  
Use restrictive covenants to protect solar access.  
Ensure that restrictive covenants do not impede renewable energy use, e.g., by prohibiting clotheslines or solar collectors.

Consents to Convey Land

s.29  
Planning Act

Consents to divide land granted by committee of adjustment, land division committee or Minister of Housing.

Consents may be made conditional on any matter which may be included in a subdivision agreement.

Longer-Term Actions: Community Improvement and Redevelopment

Redevelopment Plans

s.22  
Planning Act

Municipalities with official plans. Schemes to redevelop or rehabilitate designated areas.

Include insulation, double glazing and weatherizing in rehabilitation of existing buildings.  
Provide for district heating and/or use of waste heat in redevelopment plan.  
Make grants or loans to building owners for energy-conserving improvements.

## 1.0 INTRODUCTION

Ontario municipalities have a wide variety of legal powers which can be used to encourage the efficient use of energy in their communities. These range from specific and direct measures, such as minimum temperature by-laws, to broader but indirect measures, such as official plans, which have a major impact on the future demand for energy by controlling the pattern of development.

It is clear, of course, that energy efficiency\* will not come about merely by passing laws. Public participation and support, appropriate advice and information, and leadership by example are equally important factors in a municipal energy-efficiency program, particularly where lifestyle changes are involved. The purpose of this paper is to outline those legal powers which municipalities already have and to facilitate their use by interested municipalities.

Wherever possible, the powers discussed will be illustrated with examples of their possible uses. Unfortunately, it is not possible to give a "model energy by-law" suitable for all municipalities, particularly in the area of development control.

Energy consumption patterns and opportunities are highly individual and must be integrated with other local planning concerns. For these reasons, only general guidelines can be given to municipalities in the use of their powers to increase energy efficiency. Some examples are included in this paper. Others are found in reports recently issued by the Ontario Ministry of Energy, such as "Subdivisions and

Sun", "New Directions in Municipal Energy Conservation: The California Experience", and "Residential Site Design and Energy Conservation", a study now underway by the Ontario Ministries of Housing and Energy. Together these reports point the way for municipalities that wish to pioneer in this important field.

The first section of this paper deals with the inclusion of energy policies in the official plan, to provide policies and objectives for a municipal energy-efficiency program. Subsequent sections discuss legal means by which such energy policies and objectives can be achieved, commencing with immediate actions to reduce energy consumption in transportation and existing buildings.

Longer-terms measures are then reviewed, both in the area of "greenfields" developments and in the improvement of existing communities. The final section outlines the impact of the proposed new draft Planning Act on municipal powers in this area.

## 2.0 POLICIES AND OBJECTIVES: THE OFFICIAL PLAN

The basic document which defines a municipality's planning policies and objectives is its official plan. An official plan is defined as:

"a program and policy . . . covering a planning area (usually a municipality) or any part thereof, designed to secure the health, safety, convenience or welfare of the inhabitants of the area . . ."  
(s.1) \*

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\* Including energy conservation and the use of renewable/recoverable energy.



Although official plans are not compulsory\*\* and do not themselves have any direct regulatory impact, they form the basic policy framework for most other municipal planning actions. No by-law may breach an official plan:

"Where an official plan is in effect, no public work shall be undertaken . . . no by-law shall be passed for any purpose that does not conform therewith." (s19.(1)).

Certain types of by-laws, such as property standards by-laws, cannot even be passed without an appropriate underpinning in the official plan or an equivalent policy statement.

Energy is not explicitly mentioned in the definition of an official plan, a document which is primarily intended to guide a municipality's physical development. However, many energy matters are intimately related both to the physical planning of a municipality and to the "convenience or welfare" of its inhabitants and, therefore, may be included in an official plan. Indeed, several official plans have recently been adopted which include limited energy policies, such as the Halton and Kincardine Official Plans. The City of Toronto has also proposed energy policies for inclusion in its official plan.

Of course, not all energy concerns can be included in an official plan. Some, such as oil supply and pricing and The

Building Code, are clearly beyond municipal jurisdiction. However, many energy-related matters which bear on the physical development of a municipality and which are subject to its regulation can be included in its official plan. These include:

#### Energy Supply:

- energy recovery from municipal waste,
- district heating,
- local electric generation,
- access to sunlight;

#### Energy Demand:

- compact, medium density, mixed-use development,
- public transit, bicycles and other alternatives to the private auto.

Energy policy statements in official plans can play at least two important roles. First, the official plan offers a major platform for the demonstration of municipal commitment to the efficient use of energy. Such a commitment by Council can lead the way for other initiatives by municipal staff and local residents. Second, inclusion of an energy policy in the official plan would provide the basis for inclusion of energy considerations in zoning by-laws, property standards by-laws, and subdivision approvals.

An example of a possible energy policy statement is included as Appendix 1.

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\* All statutory citations are to The Planning Act, R.S.O. 1970, c.349 unless otherwise stated.

\*\* Except as a precondition to the exercise of certain municipal powers.

### 3.0 IMMEDIATE ACTIONS: TRANSPORTATION

Municipalities have many routes by which official plan energy policies can be given effect. Many traditional planning measures (which will be discussed later), are relatively long-term and affect only new development, but there are short-term actions that can have an immediate impact. One area of particular importance is that of transportation, since transportation is almost entirely petroleum-dependent and since petroleum is the source of energy whose price and supply are most volatile.

The energy efficiency of public transit is well known, and there have been numerous studies of methods to increase transit use. Some methods currently in use include fare subsidies (authorized by s.354(1) par. 89,90, The Municipal Act, R.S.O. 1970, c.284), "park and ride" parking lots at convenient locations (s.352par.72, *ibid*), and bus shelters (s.354(1)par.90, *ibid*).

Less attention has been given to encouraging other methods of energy-efficient transportation, including more efficient use of private automobiles. For example, The Municipal Act expressly authorizes municipalities to establish special traffic lanes designated "solely or principally" for use by public transit vehicles\* (s.460 par. 9) or bicycles (s.460 par. 10) at specific times, and to prohibit or regulate the use of such lanes by other vehicles.

Such lanes have proved highly effective in improving rush hour transit service on streets with four lanes or more. The power to regulate use of the lanes by other vehicles, together with the general power to regulate traffic under 's.354(1) par. 107 of The Municipal Act, can also be used to permit car or van pools\*\* to share bus lanes, while excluding other traffic.

During rush hours, access to such special lanes could significantly increase the speed of getting to work by bus or car pool, possibly outstripping the traffic-bound single-occupant car.

Since convenience and speed are the key advantages of private cars, this would undoubtedly be a powerful inducement to more widespread use of the alternatives. Bicycle travel can also be made much more pleasant and safe by special lanes, particularly during the summer.

To be effective, special bus and car pools would, of course, have to be prominently marked, widely advertised, and appropriately enforced. In some cases, reversible centre lanes (s.354(1)par.107 The Municipal Act) may smooth traffic flow, and assist in minimizing the disruptions caused by creating designated bus lanes (see figure 1). Complementary initiatives might include preferential parking rates and reserved spaces for car pools in municipally owned lots

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\* Note, however, that bus lanes can only be created under this section for vehicles owned and operated "by, for, or on behalf of the municipality". Without additional legislation such as s.79a of The Municipality Of Metropolitan Toronto Act, R.S.O. 1970, c.295, bus lanes cannot be created principally for the use of buses owned and operated by an independent agency, such as GO Transit or the Toronto Transit Commission.

\*\* Defined, for example, as all motor vehicles containing three or more persons.

(s.351par.72, *ibid*), encouragement and assistance to municipal employees wishing to set up car pools, and encouragement to major employers to establish car and van pools among their employees.

The energy consumption of automobiles can also be reduced by smoothing traffic flow, since stop-and-go operation consumes large amounts of fuel. Traffic can be smoothed by computerized control of traffic signals (s.354(1)par.107, *The Municipal Act*), by restricting on-street parking, particularly during rush hours (*ibid*), and by converting four-way stops to two-way stops or pedestrian crosswalks where consistent with public safety (s.460 par.7, *ibid*). However, if additional cars are attracted by the smoother traffic flow, the net energy impact may be questionable.

Idling vehicles can also consume large amounts of fuel. In urban areas, idling by automobiles can be minimized under s.363 par.8 of *The Municipal Act* since most idling vehicles are left unlocked.

"363. By-laws may be passed by the councils of urban municipalities:

8. For prohibiting any person driving or in charge of a motor vehicle, other than a commercial motor vehicle, from allowing such motor vehicle to stand unattended unless it is locked in such a manner as to prevent its operation by any person not authorized by the owner, driver or person in charge."

This section does not apply to commercial motor vehicles, defined as:

"a motor vehicle having permanently attached thereto a truck or delivery body and includes ambulances, hearses, casket wagons, fire apparatus, buses and tractors used for hauling purposes on the highways."

(s.1(1) par. 3, *The Highway Traffic Act*, R.S.O. 1970, c.202)

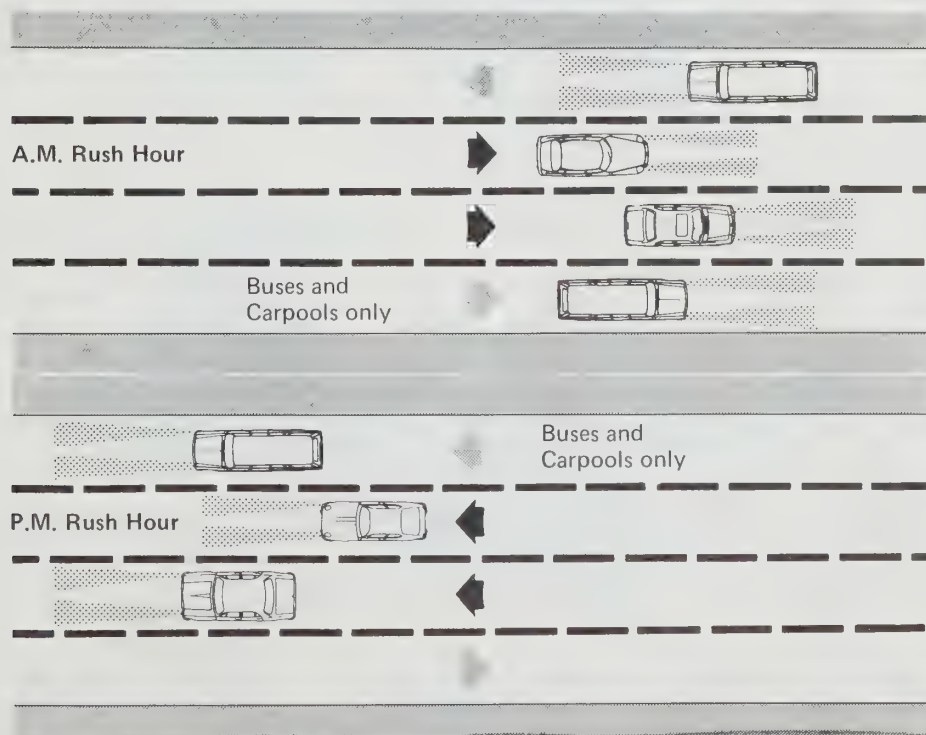


Figure 1

Reversible lanes can be used to accommodate rush hour traffic. Bus and career lanes make shared transportation faster.



#### 4.0 IMMEDIATE ACTIONS: EXISTING BUILDINGS

##### 4.1 Introduction

Many of the buildings which will be in use between now and 2000 A.D. are already built. Many were constructed with little thought of energy efficiency. Municipalities can encourage improvements in the energy efficiency of existing buildings by providing financial incentives, by preserving access to sunlight, by ensuring that voluntary improvements are not hindered by existing by-laws, and by direct regulation.

##### 4.2 Taxes

Some energy conserving improvements, being capital intensive, may raise the assessed value of an existing building. The resulting increase in property taxes may absorb most of the savings in fuel costs. While it is not yet clear that energy-conserving improvements do increase market and assessed value, they could do so as public awareness of energy costs grows. When this occurs, the risk of property tax increases could impede retrofitting of existing buildings.

While direct tax exemptions are not within municipal power, municipalities can avoid this problem by adopting a policy of rebating increases in property taxes due solely to improvements in energy efficiency, perhaps for a reasonable payback period, such as two to five years.

Such rebates can be made as grants under s.248A(1) of The Municipal Act:

"Notwithstanding any special provision in this Act or in any other general or special Act, the council of every municipality may, subject to section 248, make grants, on

such terms and conditions as security and otherwise as the council may consider expedient, to any person, institution, association, group or body of any kind, including a fund, within or outside the boundaries of the municipality for any purpose that, in the opinion of the council, is in the interests of the municipality."

Care would, of course, be required to separate tax increases qualifying for the rebate from those generated by other features of an improvement, for example, the increased floor area resulting from the addition of a greenhouse.

##### 4.3 Variances and Exemptions from Zoning

In some circumstances, current municipal by-laws may inadvertently obstruct improvements in energy efficiency. For example, an owner wishing to install solar collectors on his roof may discover that the roof already reaches the maximum permissible height under the local zoning by-law (s.35(1)par.4, The Planning Act; see figure 2). Greenhouse or solar furnace additions may be prohibited by setback or coverage standards or external design restrictions (s.35(1)par.4).

The would-be solar user in this example would have to apply to the local committee of adjustment (established independently of the council under s.41) for a variance, i.e., permission to not comply with the relevant zoning by-law. On the owner's request, a committee of adjustment may:

"authorize such minor variance from the provisions of the by-law . . . as in its opinion is desirable for the appropriate development or use of the land, building or structure, provide that in the opinion of the com-

mittee the general intent and purpose of the by-law and of the official plan, if any, are maintained." (s.42(1))

While not all committees of adjustment agree with the policies of their councils, a strong statement in the official plan in support of renewable energy could assist the owner to persuade the committee to grant the variance. He would be able to argue that the general intent and purpose of the plan would be furthered by his project, and therefore by the variance, particularly if he could demonstrate that the variance was essential to the technical and/or economic viability of his proposal.

It may also be desirable from an energy point of view to provide limited exemptions from zoning in built up areas for certain specified additions whose primary purpose is to conserve energy or to use renewable/recoverable energy. Such exemptions could permit solar collectors, windmills, and greenhouses, for example, to deviate from standards for height, lot coverage or setback by up to a certain percentage (see figure 3). This could encourage retrofitting in existing areas without creating an unacceptable streetscape.

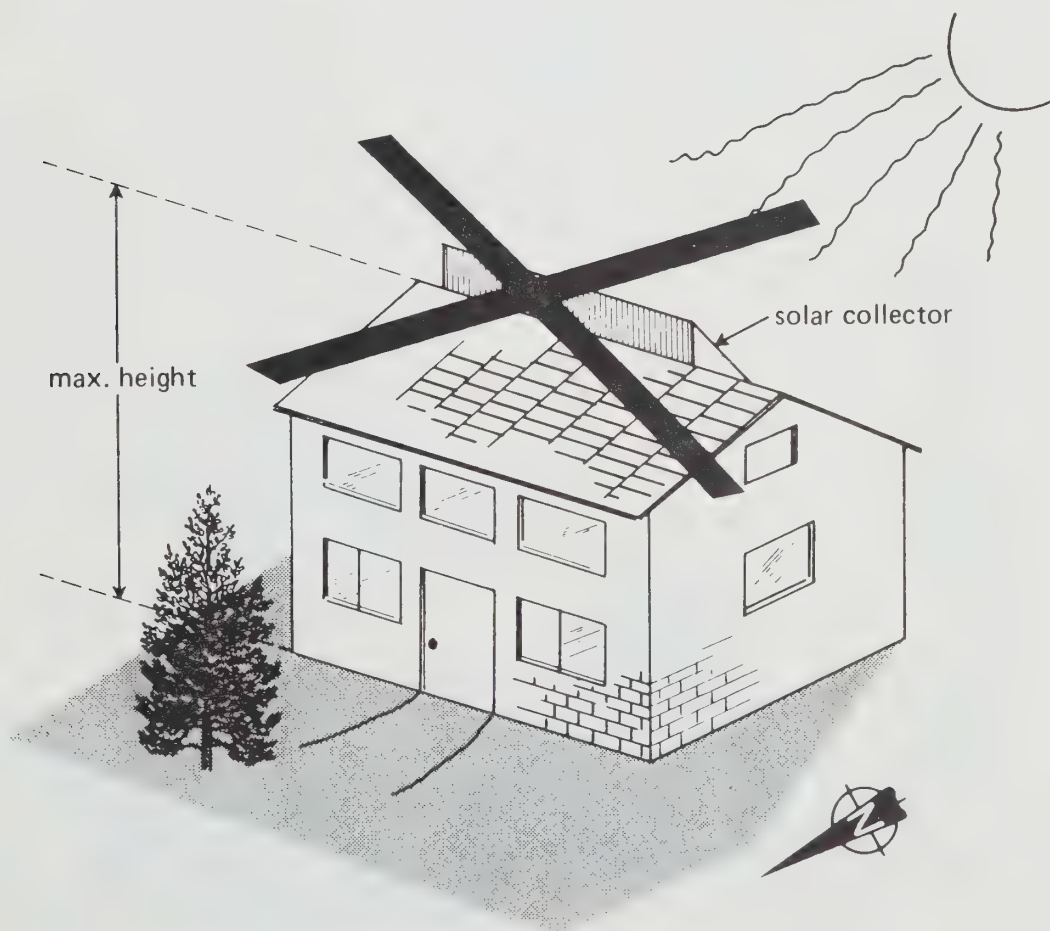


Figure 2

Energy-Conserving improvements like solar collectors may be prohibited by zoning.

#### 4.4 Preservation of Access to Sunlight

In some cases, it might be appropriate to revise existing zoning by-laws to protect the access to sunlight now enjoyed by urban residents. For example, in most zoning by-laws, building height is measured from the average between the roof peak and the eave. This encourages a variety of roof shapes, but also permits steeply angled roofs to rise above their neighbours and to cast unusually long shadows (see figure 4). To protect access to sunlight, zoning height limits could apply to the highest part of a roof, excluding insubstantial obstacles such as aerials and chimneys. Solar collectors might also be exempt, or permitted to rise above the general height limit by five or 10 feet, although this would risk shading neighbouring collectors.

In some areas, height limits may not be higher than present buildings require, or shift abruptly between adjacent areas, permitting the construction of tall buildings shading dozens of their neighbours. While it is not desirable to restrict all buildings to one or two stories, shading of roofs can be minimized if building heights are approximately uniform and change gradually from south to north (see figure 5). Even in high-rise areas, access to sunlight at the rooftop can be an important resource. In Israel, for example, many high-rise apartment building roofs are dotted with solar hot water heaters, each serving separate apartment.

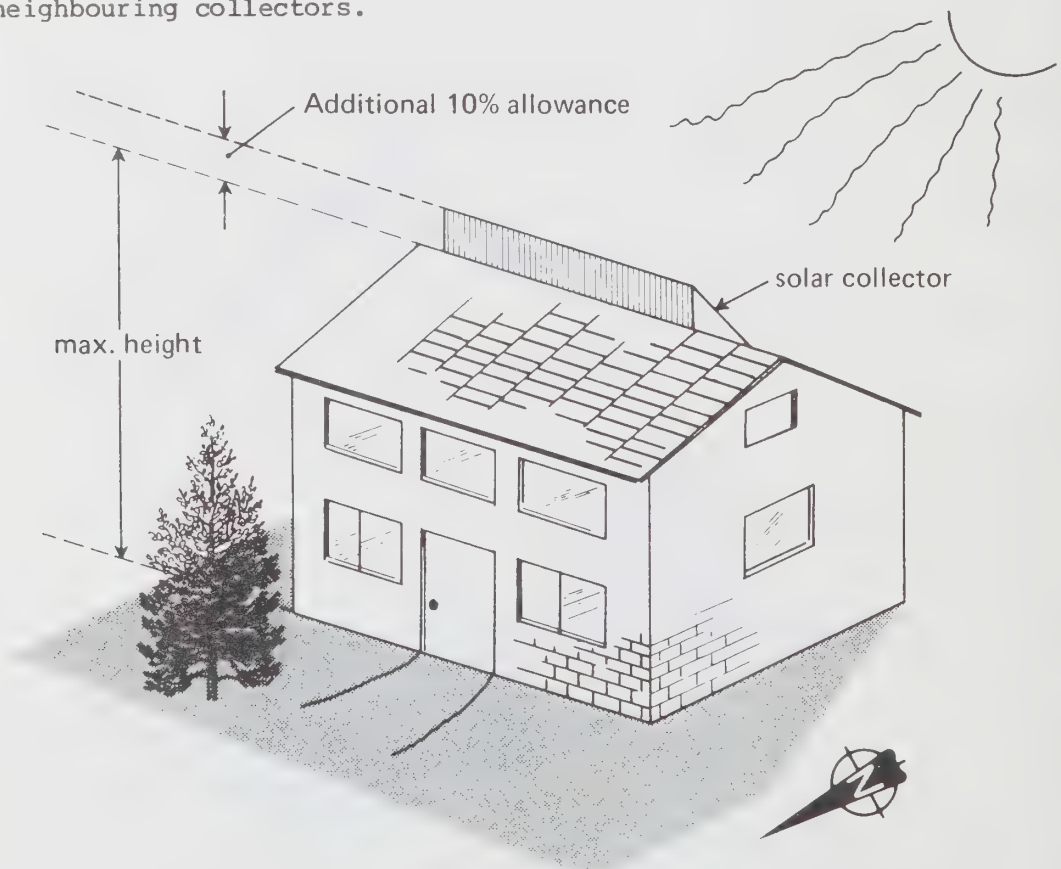


Figure 3

Solar collectors could be permitted to vary from zoning height limits by, for example, 10 per cent.





Figure 4

For zoning, building heights are usually measured at the average of the roof peak and eave. This means that steeply angled roofs can cast unusually long shadows.

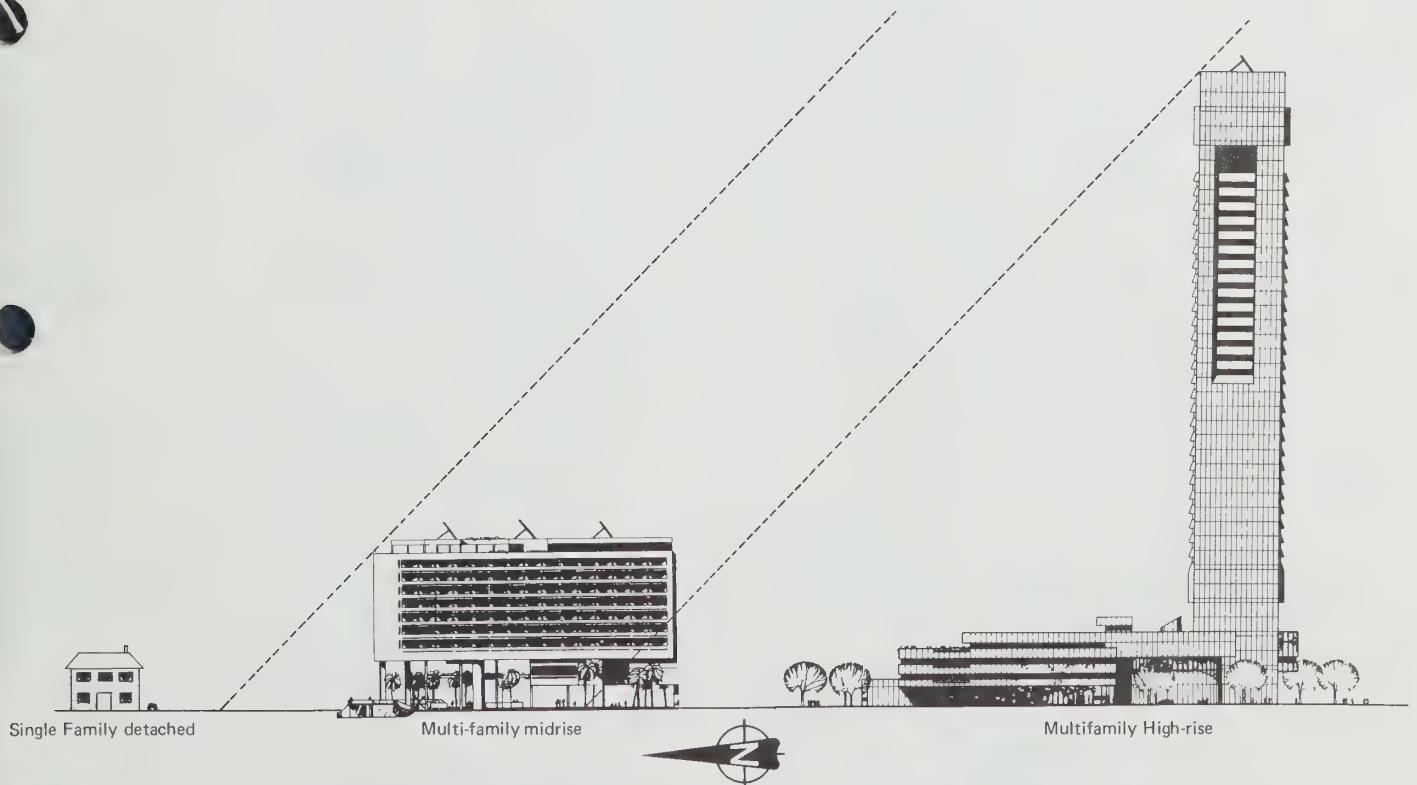


Figure 5

Shading can be minimized if building heights change gradually between different sections of the city.

#### 4.5 Minimum Temperature By-laws

The Municipal Act,  
s.354(1)par.64 authorizes local  
municipalities to pass by-laws:

"for requiring the maintenance of adequate and suitable heat for rented or leased dwellings or living accommodation that, as between tenant or lessee and the landlord is normally heated by or at the expense of the landlord, for defining adequate and suitable heat for such purposes and for providing for the inspection of such dwelling or living accommodation."

Such by-laws can be important in ensuring tenants' health and comfort.

Unfortunately, many minimum temperature by-laws require temperatures as high as 22°C, despite the fact that 22°C, temperatures are often not necessary for comfort, and have substantial energy penalties. Many homeowners can reduce their heating bills by five to 10 per cent by maintaining winter temperatures of 20°C during the day, and 18°C or less at night (e.g. 12 p.m. to 6 a.m.), although care should be taken with infants, the elderly, and the sick. Appropriate minimum temperature by-laws would permit landlords to do the same.

#### 4.6 Property Standards By-laws

Section 36 of The Planning Act authorizes municipalities with property standards policies in their official plan to pass by-laws:

"(3)(c) for prescribing standards for the maintenance and occupancy of property within the municipality or within any defined area or areas and for prohibiting the occupancy or use of

such property that does not conform to the standards; and

" (d) for requiring property that does not conform to the standards to be repaired and maintained to conform to the standards or for the site to be cleared of all buildings, structures, debris or refuse and left in a graded and levelled condition."

Municipalities without an appropriately worded official plan may also pass property standards by-laws if they first adopt a formal policy statement setting out their intentions (s.36(2), The Planning Act).

Repair is defined to include:

"the provision of such facilities and the making of additions or alterations or the taking of such action as may be required so that the property shall conform to the standards established in a by-law passed under this section." (s.36(1)(f) emphasis added)

This broadly worded section can be interpreted to authorize a municipality with an appropriate policy statement, by by-law, to require building owners to adopt repair and maintenance practices that are reasonable from an energy point of view. Such practices might include regular furnace efficiency tests, weatherizing doors and windows, and avoiding excessive mechanical heating, cooling or lighting. Other "repairs" could include addition of window blinds, shutters or awnings, and similar minor items.

Property standards by-laws cannot, however, require any "material alteration" of a

building, since this is "construction", as defined by The Building Code Act, S.O. 1974, c. 74, and is subject exclusively to that Act.

Property standards by-laws are presently used only to protect the health and safety of occupants, to prevent the creation of public nuisances, and to avoid the deterioration of neighbourhoods. Although no such limit is mentioned in the Act, courts may hesitate to uphold radically new uses of the power. It is possible to argue that the wasteful consumption of energy, particularly petroleum, has such a serious impact on the economy as to itself be a public nuisance, but this argument is not certain to succeed before the courts.

In addition to these legal problems, there are more practical obstacles. Since few property standards officers or committees are sufficiently knowledgeable in the energy field, training programs would be necessary. Furthermore, the traditional "penal" role of the property standards officer may make him/her an unwelcome visitor, even when the visit may benefit the owner. This was illustrated by the experience of property standards officers acting as estimators and loan approval officers under the Residential Rehabilitation Assistance Program and the Ontario Home Renewable Program.

Notwithstanding these difficulties, property standards by-laws are an attractive means of increasing energy efficiency, particularly in municipalities where they are working well for other purposes, because:

1. They can apply to all or part of the existing buildings in a municipality.

2. There is an existing structure of inspection, enforcement, and appeal, including property standards officers who can provide individual inspections and advice.

This means, for example, that interested building owners could request a property standards officer to inspect their property and advise them of the measures to be taken to conform with the by-law. The officer could, in effect, perform a simplified energy audit for the owner, together with the usual review of structural and other non-energy problems. The normal procedure of appeals to the property standards committee would be available in case of dispute.

The building owner would then arrange for any deficiencies identified by the property standards officer to be remedied. After completion of the work, the property standards officer could return to the building to ensure that the work had been properly performed and that the building now conformed to the by-law.

3. Compliance can be wholly or partially funded with municipal assistance. Since many energy conserving improvements are capital intensive, they are particularly sensitive to high interest rates. Municipalities are authorized by The Planning Act (s.37) to make grants and loans to building owners to pay for the whole or part of the cost of any measures required to conform to a property standards by-law. Loans may be made on any terms the council may prescribe and may be recovered with interest by addition to the collector's roll. Although some municipalities lack the financial resources to take advantage of this power, it may conceivably be useful in some instances.



Such a scheme has several advantages. It could effect an immediate and long-lasting reduction in the municipality's energy consumption, possibly alleviating pollution as a side effect. Thus it could significantly reduce the total cost of energy for municipal residents, while stimulating local businesses and make the municipality, as a whole, a more attractive place to live.

## 5.0 LONGER-TERM ACTIONS: NEW DEVELOPMENT

### 5.1 Introduction

From the point of view of encouraging energy efficiency, the powers of municipalities are greatest in the area of community planning, particularly in their review of new development.

Legal tools in this area include conditions imposed on consents (s.39(12)); subdivision approvals, particularly where delegated to the municipality by the Minister of Housing (s.33); subdivision agreements (s.33); zoning by-laws (s.35) and site plan by-laws (s.35A).

Municipalities already can exercise extensive powers in the regulation of development and often participate in the planning of such development from its earliest stages. Accordingly, no new procedures are required to include energy considerations in development review. In the short term, however, municipalities may wish to concentrate on advising developers of energy opportunities and ensuring that innovative and energy-conscious proposals receive a favourable reception.

The most important single factor in improving energy efficiency, both now and in the future, is density, another factor legally under municipal control.

Although medium and higher densities have encountered increasing resistance in recent years, medium density buildings (10 to 15 units per acre) are more energy-efficient, partly because their units are often smaller and partly because they have proportionately less external surface area (basements, roofs, and outside walls) (see figure 6).

For example, the "Ontario Residential And Commercial Energy Demand Study", a report issued by the Ministry of Energy, showed that while a typical, new detached house in Toronto consumes 121 Mcf (thousand cubic feet) of natural gas per year, a semi-detached house consumes 80.8 Mcf/year and a row-house only 47.8 Mcf/year.

Substantial additional savings are possible from the reduced amount of energy required for servicing and for municipal operations in medium density developments, and from the greater potential for public transit, car pooling, and district heating. Mixed-use development, including the reintroduction of the corner store, could also reduce the length of trips to work, shopping and schools. This would permit some trips to be made by bicycle or on foot.

Residential Site Design And Energy Conservation, a study underway by the Ministry of Housing and the Ministry of Energy, indicates that even in low density developments, energy consumption can be cut significantly by simple adjustments in street, lot, house, and vegetation placements without any increase in cost, decrease in density or change in housing mix (see figure 7). The adjustments reviewed include:

- a) orientation of streets in an east-west direction where possible;

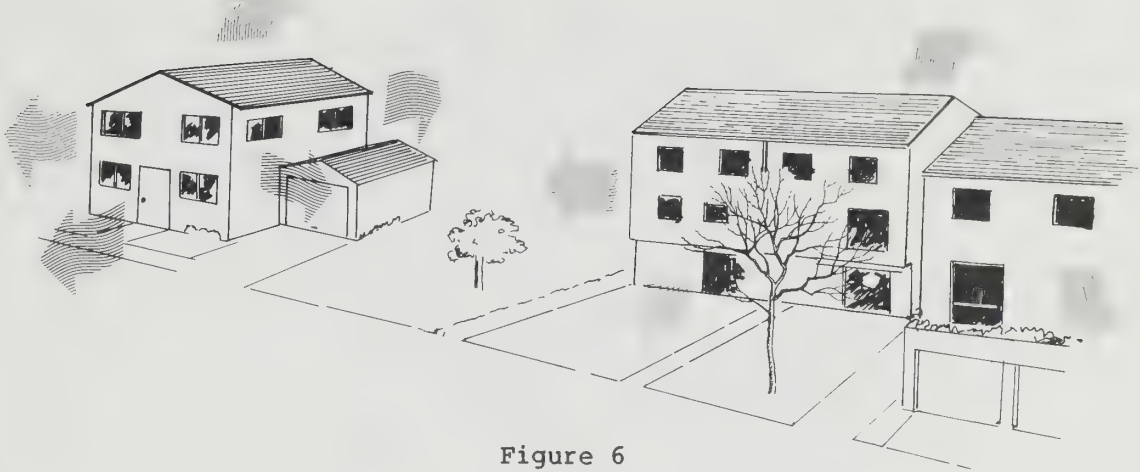


Figure 6

Attached buildings lose less heat because they have fewer external walls.

- b) orientation of houses with their major windows to the south;
- c) use of all available landscaping to provide shelter from prevailing winter winds;
- d) location of the most orientation-sensitive homes, such as street townhouses on the south sides of east-west streets, where their back walls (with most of their windows) will face south; and
- e) use of large detached homes with their many windows and large lots in areas, such as north-south streets, where smaller homes would be shaded.

Even a simple change from single-storey to two-storey housing can significantly reduce energy use, because two storey buildings lose less heat through their proportionately smaller exterior walls, roofs, and basements. All of these factors can be influenced by municipalities.

Over the longer term, buildings which are free of shade and oriented to the south will be readily capable of retrofitting with active solar heating systems

when these become economical, probably during the next decade.

Careful planning and forethought now can preserve the solar option for many of the 600,000 homes expected to be built in the next decade, homes that will become increasingly valuable because of their access to the sun. If conventional planning continues, however, this option may be foreclosed for the owners of the majority of new homes.

## 5.2 Zoning

Development control can be exercised by municipalities through zoning by-laws under s.35(1) of The Planning Act.

"By-laws may be passed by the councils of municipalities for

- 4. regulating the cost or type of construction and the height, bulk, location, size, floor area, spacing, external design, character and use of buildings or structures to be erected within the municipality



Figure 7

Low density subdivision designed for energy efficient:  
 east-west streets  
 house types located to maximize access to sunlight  
 trees used as windbreaker

or within any defined area . . . and the minimum frontage and depth of the parcel of land and the proportion of the parcel of land and the proportion of the area thereof that any building or structure may occupy."

Zoning by-laws may be used to promote energy efficiency in several ways. Their first and most important function is to determine the density of development and the mixture of uses since, as already discussed, medium density, mixed-used developments are the most energy efficient.

Given the density and use of an area, zoning by-laws regulating the height, location, spacing, and external design of buildings can be used to maximize the present and future use of solar energy. For example, the City of Brampton passed a pioneering zoning by-law in 1979 which set two new require-

ments for residential subdivisions in part of the city. First, the main wall of all buildings (the wall with the largest glass area) must face within 20 degrees of due south. Second, the height limit for new buildings is not the same everywhere on a lot, but is higher at the south end of each lot and lower at the north, reducing the likelihood of a building shading its neighbour (see figure 8).

Although the Brampton by-law does not take account of topography or wind, it does contribute to the use of solar energy in several ways. First, during the heating season, each home will be partially warmed by the sun streaming into its south-facing windows and will, therefore, require less fossil fuel than those in neighbouring subdivisions. Deliberate use of passive solar techniques (e.g., greenhouses, Trombe walls) could greatly enhance this effect.





Second, access to sunlight gives each of these homes the potential to convert to active forms of solar heating (e.g., solar collectors) when this becomes economically feasible.

Third, the sloping height limit will tend to encourage the construction of roofs in the shape shown in figure 9. In addition to minimizing the shade of buildings to the north, this shape provides a steeply angled, south-facing roof

which will be much more suitable for the installation of collectors than the usual relatively flat roof.

Another area of concern is the impact of zoning by-laws and traditional planning practices on innovative developments. Cluster development, key-lotting, front-to-back duplexes, and other proposals to improve the energy efficiency of new developments often breach traditional zoning (see figure 10).

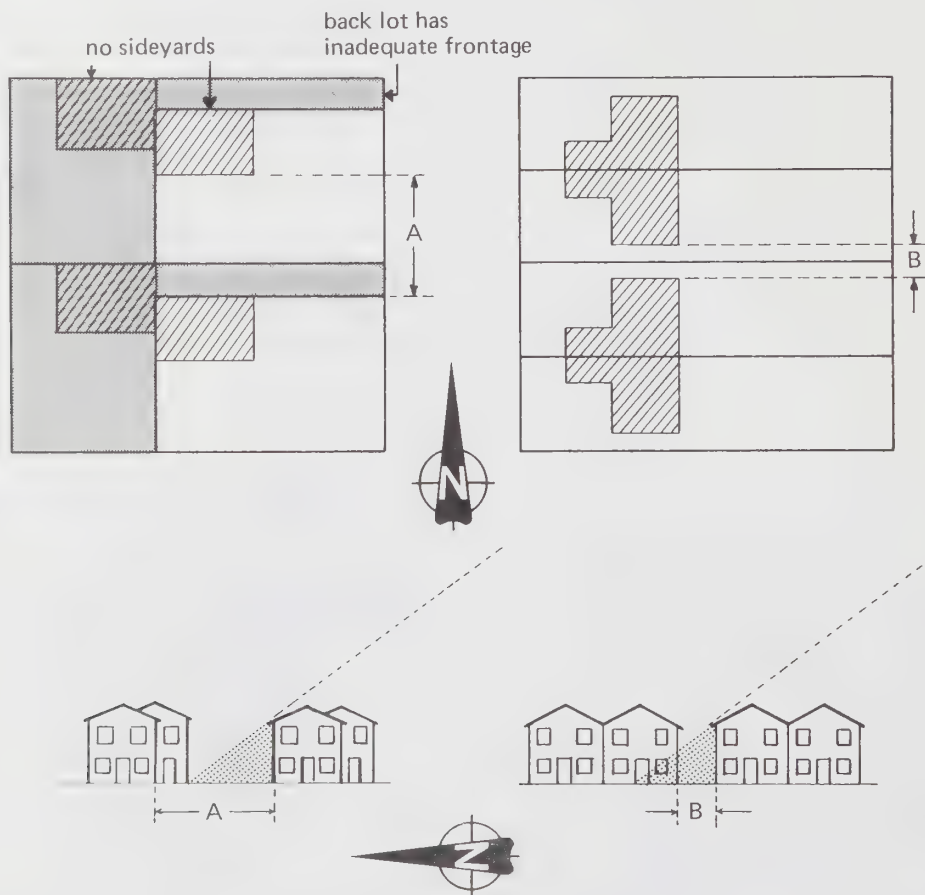


Figure 10

Front-to-back duplexes (left side of drawing) can preserve access to sunlight on north-south streets, but may breach frontage and sideyard restrictions in zoning by-laws. Here, house and lot sizes on each side of the street are the same, but only the houses on the left receive sunlight. The houses on the right meet typical zoning standards.

After more experience is gained with energy-conscious planning, zoning by-laws could go further to encourage the construction of buildings which conserve energy or preserve access to sunlight. For example, this could be achieved by:

- a) exempting the cost of features used primarily to conserve energy or to use renewable/recoverable energy from cost ceilings for new construction imposed under s.35(1) par.4;
- b) requiring roofs to be constructed with at least part of their area at a good angle and orientation for later installation of solar collectors (e.g. 40° to 60° from the horizontal, facing within 30° due south)
- c) regulating the location of above-ground garages and other accessory structures to avoid unnecessary shading;
- d) requiring a minimum area of south-facing windows;
- e) prescribing a maximum area of north-facing windows; and
- f) requiring windows to be equipped with thermal shutters.

### 5.3 Site Plan By-laws

Section 35a of The Planning Act authorizes municipalities with official plans to designate the whole or any part of the area covered by the official plan as a site plan control area (subsection 2). In a site plan control area, buildings may not be built or extended and commercial parking lots may not be established until the plans for the site have been approved by the Council or the Ontario Municipal Board (subsection 4).

The plans which are submitted for approval must include:

"Drawings showing plan, elevation and cross-section views for each industrial and commercial building to be erected and for each residential building containing twenty-five or more dwelling units to be erected which are sufficient to display ...

- b) the relationship of the proposed building to adjacent buildings, streets and exterior areas to which members of the public have access." (s.35a(4) par. 2).

Since part of the relationship of a proposed building to its neighbours is the shadow it will cast, the drawings could be required to show such shadows. Shadow plotting would be useful both in assessing the impact of the proposed development and in directing attention to the opportunities for preserving solar access. However, the municipality cannot prohibit the new building from shadowing other buildings, except by height or other controls under s.35.

Approval of site plans can be made subject to conditions which improve the energy efficiency of the development or its neighbours:

"s.35a(6): As a condition to the approval of /site plans/ a municipality may require the owner of the land to,

- (a) provide to the satisfaction of and at no expense to the municipality any or all of the following:



- (3) Off-street vehicular loading and parking facilities, either covered or uncovered, access driveways, including driveways for emergency vehicles, and the surfacing of such areas and driveways;
- (4) Walkways, including the surfacing thereof, and all other means of pedestrian access;
- (5) Facilities for the lighting, including flood lighting, of the land or of any buildings or structures thereon;
- (6) Walls, fences, hedges, trees, shrubs or other groundcover or facilities for the landscaping of the lands or the protection of adjoining lands;
- (7) Vaults, central storage and collection areas and other facilities and enclosures for the storage of garbage and other waste material;
- (9) Grading or alteration in elevation or contour of the land and provision for the disposal of storm, surface and waste water from the land and from any buildings or structures thereon."

This power might be used, for example, to require a commercial parking lot to include and be surrounded by rows of trees (s.35a(6)(a) par.6) (see figure 11). Trees can both screen a lot from view and moderate its energy impact on its neighbours.

Parking lot lighting may also be made more efficient by appropriate conditions under s.35a(6)(a) par. 5.

Other types of development might be subject to one or more of the following conditions:

1. Construction of centrally located pedestrian walkways, sheltered from wind by walls, fences or trees, to encourage trips on foot (s.35a(6)(a) par. 4,6);
2. Reduction or elimination of flood-lighting, or use of high-efficiency external lighting systems, such as high-pressure sodium lamps, (s.35a(6)(a) par. 5);
3. Planting of coniferous wind-breaks to the north west of buildings and recreational open spaces, with no trees placed to shade the southern wall of any building (s.35a(6)(a) par. 6);
4. Construction of a waste recycling depot and compost bin conveniently located and screened from view (s.35a(6)(a) par. 6,7); and
5. Construction of berms (low earth walls) to provide insulation and windbreaks (s.35a(6)(a) par. 7).

Municipalities may require all of the conditions to be provided and permanently maintained at the owner's expense (s.35a(6)(b)). To ensure their enforcement, the conditions may be included in an agreement between the owner and the municipality (s.35a(6)(c) and registered against the land (s.35a(7)).

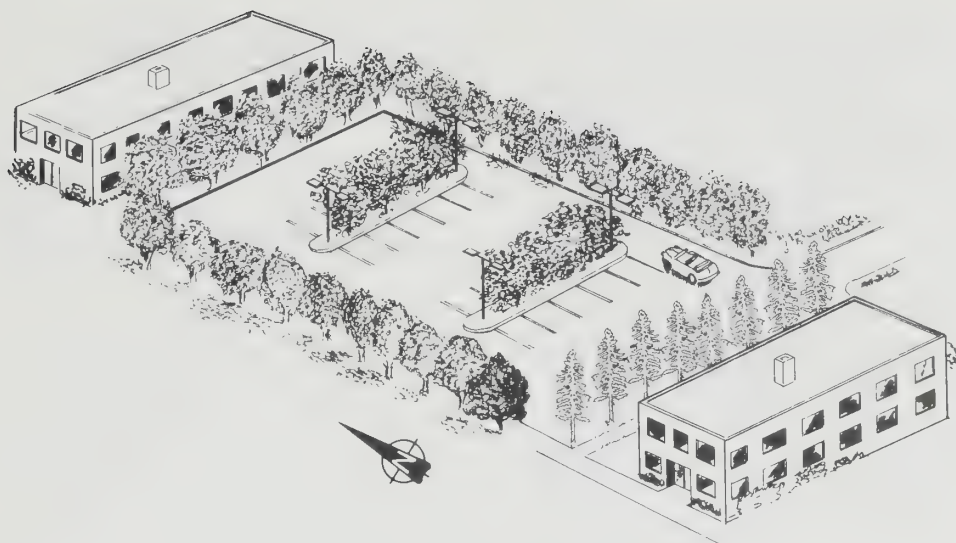


Figure 11

Deciduous trees keep parking lots from radiating heat into neighbouring buildings. Conifers provide windbreaks all the year round. High pressure sodium lamps provide ample light but are very energy-efficient.



Figure 12

Parks can contribute to energy conservation by preserving access to sunlight, and providing windbreaks and bicycle paths.

## 5.4 Parks

Section 35b of *The Planning Act* authorizes a municipality to require by by-law that up to five per cent of the land proposed for any development be conveyed to the municipality for park purposes. By appropriate agreements with developers, such parks can be designed and located so as to improve energy efficiency (see figure 12). For example, location of a park at the south end of the development can provide solar access to buildings to the north which would otherwise be shaded.

In other cases, it may be more energy-efficient to use all or part of the park allocation to provide a mid-block system of pedestrian or bicycle paths in order to increase the attractiveness of alternatives to the private automobile.

The landscaping of municipal parks may also contribute to energy efficiency. Coniferous windbreaks, for example, may be located to the south in order to shelter adjoining buildings from winter winds, and deciduous trees to the north to provide summer shade without interfering with solar access in winter.

## 5.5 Subdivision Approval

A municipality's powers are greatest when land is to be subdivided, because the broad powers to impose conditions granted by s.29 and s.33 of *The Planning Act*. Section 33 prohibits the subdivision of land except in accordance with a plan of subdivision approved by the Minister of Housing.

In some cases, the Minister's power to approve plans of subdivision has been delegated to a municipal council under s.44b of *The Planning Act*; in other cases, the Minister has the formal power of approval but consults the Council, and considers its official plan.

Subsections 4 and 5 of section 33 provide, in part:

"(4) In considering a draft plan of subdivision, regard shall be had, among other matters, to the health, safety, convenience and welfare of the future inhabitants and to the following,

(a) whether the plan conforms to the official plan and adjacent plans of subdivision, if any;

(d) the number, width, location and proposed grades and elevations of highways;

(e) the dimensions and shape of the lots;

(f) the restrictions or proposed restrictions, if any, on the land, buildings and structures proposed to be erected thereon and the restrictions, if any, on adjoining lands;

(g) conservation of natural resources ...

(h) the adequacy of utilities and municipal services;

(j) the area of land, if any, within the subdivision that, exclusive of highways, is to be conveyed or dedicated for public purposes."

"(5) The Minister may impose such conditions to the approval of a plan of subdivision as in his opinion are advisable and, in particular ...,

(a) that land to an amount determined by the Minister but not exceeding five per cent of the land included



in the plan shall be conveyed to the municipality for park purposes ...;

- (b) that such highways shall be dedicated as the Minister considers necessary;
- (c) that the owner of the land enter into one or more agreements with the municipality ... dealing with such matters as the Minister may consider necessary ..."

This broad range of powers authorizes municipalities or the Minister of Housing to encourage or require the provision of many of the energy-efficient features discussed in the Ministry of Energy's SUBDIVISIONS AND SUN report, such as:

- (a) streets oriented east/west, to maximize access to sunlight (s.33(4)(d));
- (b) narrower streets, to increase density and reduce land and operating costs (s.33(4)(d));
- (c) grid street patterns with good access to major roads, to facilitate public transit (s.33(4)(d), (h));
- (d) placement of housing types to make optimum use of sunlight, such as street townhouses on east/west streets and larger single-family homes elsewhere, through control of the dimensions and shape of lots (s.33(4)(e)); and
- (e) orientation of buildings to the south (s.33(4)(f), (g)).

Authority for other energy-related innovations may be drawn from the more general provisions of s.33(4) (a), (g), (h), and (j) and from s.33(5). An energy-

related feature, including appropriate landscaping, may contribute to achieving appropriate energy policies in the official plan (s.33(4)(a)) or the conservation of natural resources, particularly fossil fuels (s.33(4)(g)).

District heating and proximity to major transit routes may also contribute to the adequacy of utilities and municipal services (s.33(4)(h)); land dedicated for public purposes may include solar easements or space for future district heating systems (s.33(4)(j)).

The restrictive covenants proposed by a developer (s.33(4)(f)) require particular attention if appropriate trade-offs between energy efficiency and other goals, such as aesthetics, are to be achieved. The installation of a solar collector, for example, could be prohibited by typical covenants which limit roof structures; greenhouses, Trombe walls and even clothes lines may also be prohibited by typical covenants.

Landscaping restrictions often prohibit vegetable gardening, recycling depots, and similar activities which may be advantageous from an energy point of view. In some cases, the required placement of fences can result in excessive shading. These obstacles can be minimized by appropriate conditions negotiated when the subdivision is approved.

Conditions relating to the layout of a subdivision, its proposed restrictive covenants, and similar energy-related characteristics can be made the subject of a subdivision agreement between the municipality and the developer which is registered against the land (s.33(6)). Similar conditions may also be negotiated when land is severed by consent under s.29(12).

## 6.0 LONGER-TERM ACTIONS: COMMUNITY IMPROVEMENT AND REDEVELOPMENT

### 6.1 Introduction

In existing built-up areas, many of the development control powers discussed in the foregoing are of little relevance (e.g., street orientation). From time to time, however, these areas do undergo redevelopment or substantial improvement, thus offering opportunities to improve their energy efficiency. As in new developments, increases in density, etc., to improve energy efficiency may require trade-offs with other goals, such as aesthetics.

### 6.2 Infilling

On the smallest scale, density, yard and coverage limits of zoning by-laws (s.35(1) par. 4) can be amended to permit infilling on both regular and substandard lots (see figure 13). Like increased densities in new developments, infilling may meet local resistance but can conserve energy in many ways, e.g., by reducing travel distance compared to alternative trips from suburban areas, by providing the increased density necessary for improvements in transit service and ridership, and by sheltering neighbouring buildings from wind.

Infilling frequently also requires a s.29 consent to sever existing lots. The receptiveness of the local committee of adjustment to consent applications will clearly have a major impact on infilling.

### 6.3 Large Single Buildings

One of the most common forms of redevelopment within existing urban areas is the assembly of individual parcels for the construction of a new apartment building or commercial complex. The density provisions of zoning by-laws (s.35(1) par. 4) can help to concentrate such developments where they can be served by public transit.

Lower height limits, coupled with revised setback, yard and coverage standards (s.35(1) par. 4), can also encourage the construction of low, stocky buildings which are less exposed to the wind, use less energy to heat, and minimize the shading of their neighbours (see figure 14).

### 6.4 Redevelopment Plans

On occasion, a municipal council may itself decide to take an active role in upgrading a particular urban area, usually because its buildings are dilapidated or otherwise undesirable.

If the municipality has an official plan, it may, with the approval of the Ministry of Housing, designate a defined area covered by the plan as a "redevelopment area" (s.22(2)). The municipality may then acquire land in the area (s.22(3)), and prepare a "redevelopment plan", which is a general scheme", including supporting maps and texts for:

"the planning or replanning, design or redesign, resubdivision, clearance, development, reconstruction and rehabilitation, or any of them, of a redevelopment area, and the provision of such residential commercial, industrial, public, recreational, institutional, religious, charitable or other uses, buildings, works improvements, or facilities, or spaces therefore, as may be appropriate or necessary" (s.22(1)).

Like an official plan, a redevelopment plan has no independent regulatory effect on private landowners. Once a redevelopment plan has been approved by the Minister of Housing (s.22(5)), however, the municipality may bring the plan into effect in any of three ways:

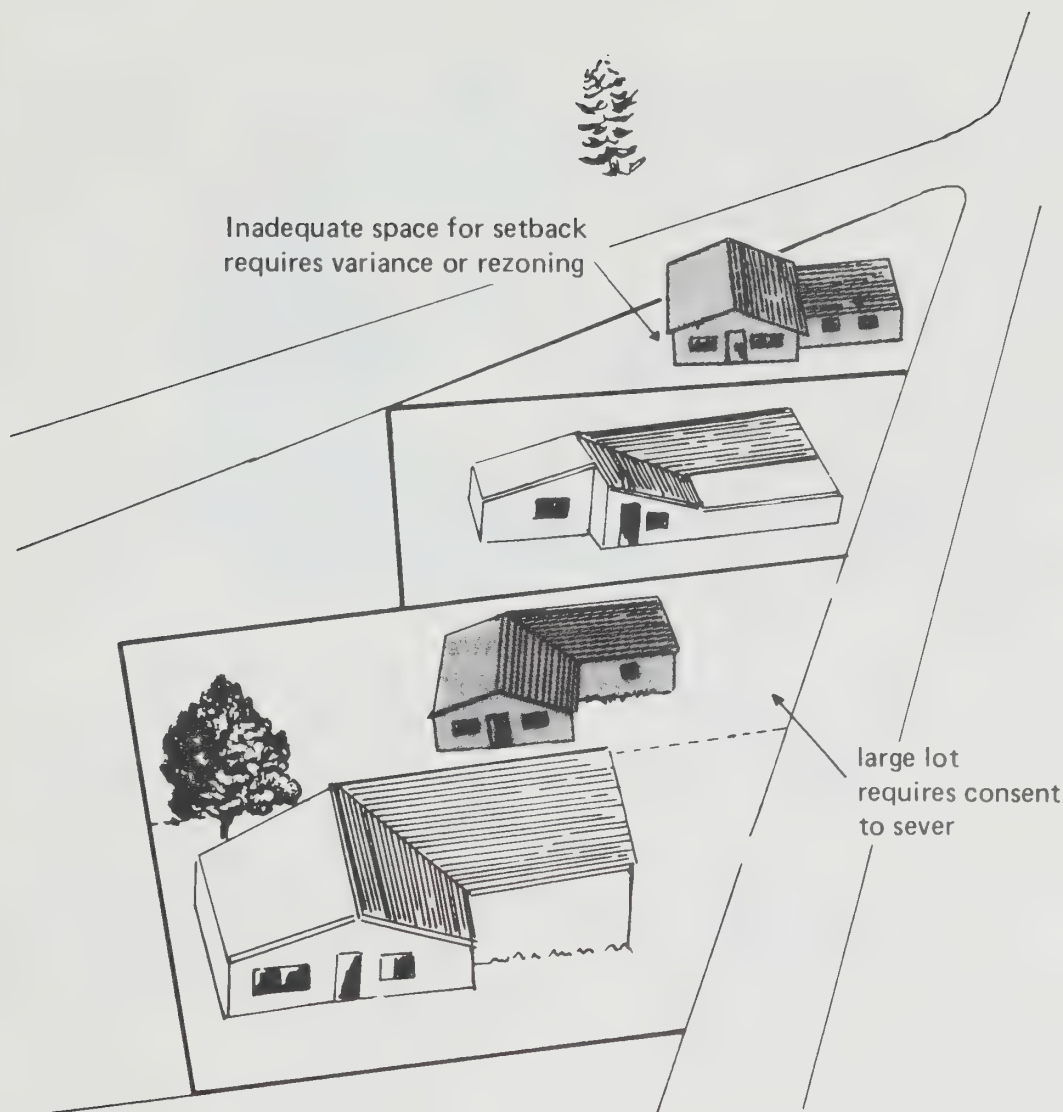


Figure 13

Opportunities exist for infilling in many urban areas, by permitting division of large lots and building on substandard lots.

- by constructing any necessary improvements itself, with the approval of the Minister (s.22(8)(a));
- with the approval of the Minister, by acquiring and then selling, leasing or otherwise disposing of land on condition that it be used as set out in the plan (s.22(8)(a)); or
- by making grants or loans to existing landowners of the cost of rehabilitation to conform with the plan (s.22(8)(a)).

Zoning by-laws (s.35) are then used to avoid undesirable future changes in development or land use, and property standards by-laws (s.36) are used to avoid building deterioration.

Redevelopment schemes are obviously inappropriate to obtain minor improvements, such as better insulation, in otherwise good buildings. Those municipalities which are contemplating or carrying out redevelopment schemes for other





Figure 14

Higher density buildings can also be designed to reduce wind exposure and unnecessary shading.

purposes, however, may wish to take advantage of the substantial opportunities for improving energy efficiency which such schemes afford.

The City of Toronto is currently using a redevelopment plan to create a "St. Lawrence Neighbourhood", a medium to high density, primarily residential community in a former industrial/commercial area near the waterfront. The plan has several energy-conserving features. First, its relatively high density and central location will greatly facilitate the use of public transit and other alternatives to the automobile for its residents. Both work and non-work trips will be minimized by the proximity of industries, shops, central business district, and the Toronto Islands.

Second, the preponderance of low-rise, attached housing forms will require relatively little energy to heat, because of their small proportion of exterior surfaces through which heat can escape.

Third, and most unusual, was the proposal to heat all buildings in the neighbourhood from a central district heating plant, connected to each building by a hot water pipeline. Initially, the central boilers were to use fossil fuels, with the long-term potential to become refuse-fired.

This third feature, district heating, faces many institutional barriers and, in fact, may not be realized in the St. Lawrence Neighbourhood. However, district heating

has commensurate advantages because of the flexibility it provides to use a variety of heat sources, particularly industrial by-product heat and energy from garbage. In the long term, mini-solar utilities providing heat and daily or seasonal storage for groups of buildings may also become feasible inclusions in redevelopment plans.

A different kind of redevelopment plan which may become more common during the next decade is one which is directed to the rehabilitation and conversion of existing buildings to create smaller housing units. Because of the declining demand for new houses and the increasing number of one-person or two-person households, a rehabilitation and conversion program is already being developed by the Ministry of Housing and the Housing and Urban Development Association of Canada. Such a plan could contribute to energy efficiency by including energy-conserving improvements, such as insulation and waste heat recovery devices, when existing buildings are modified.

#### 7.0 LONGER-TERM ACTIONS: LOCAL ENERGY SUPPLY

The principal focus of this paper is the demand for and use of energy. However, while the question of energy supply is beyond its intended scope, the reader should be aware that municipalities also possess significant powers in the area of energy supply.

Municipalities are empowered by s.18 of The Public Utilities Act, R.S.O. 1970, c.390 to "manufacture, procure, produce and supply" for their own use and the use of municipal residents such public utilities as electricity, hot water, natural gas, and steam. Towns and cities which purchase their electricity from Ontario Hydro are obliged to entrust their electrical works to the management and control of a hydro-electric or

public utilities commission (s.40 (3), The Public Utilities Act); other utilities may be so entrusted if the municipality wishes.

Thus, either directly or through its public utilities commission, a municipality may generate, purchase and distribute to its residents several forms of energy. Municipalities also have some regulatory power over private companies supplying public utilities, which require a franchise granted by the municipality (s.3, The Municipal Franchises Act, R.S.O. 1970, c.289).

These and other powers can be used to improve the efficiency of energy supply, for example, by promoting energy recovery from waste and the cogeneration of electricity.

#### 8.0 THE NEW DRAFT PLANNING ACT

In December, 1979, a draft revised Planning Act was released for public comment. Under the proposed new Act, municipal powers to affect energy efficiency will generally be the same as those under the current Planning Act. The most significant innovation, from the energy point of view, is the inclusion of "the efficient supply and use of energy" in the list of provincial interests (s.2).

The Ministry of Housing will have special powers to ensure that provincial interests are not prejudiced by municipal planning. For example, when a provincial interest is affected, the Ontario Municipal Board will only make recommendations as to the approval of an official plan or by-law; the decision will be made by the Minister.

In addition, provincial interests such as energy may be made the subject of a joint policy statement by the Ministers of Housing and (in this case) Energy (s.3). Such policy statements will

require municipalities, the Ontario Municipal Board, and other public bodies to "have regard to" energy in all their actions which affect planning, although exact compliance with the policy statement will not be necessary.

Sections 69 and 70 of the proposed Act go further by permitting the Lieutenant Governor-in-Council (the Cabinet) to adopt development standards which are binding on all municipalities. Such standards could deal with any aspect of municipal development, including density, access to sunlight, and many of the other matters discussed in this paper.

The proposed s.36 (bonus zoning) will also be important for municipalities anxious to encourage energy-efficient development. Bonus zoning allows municipalities to bargain with developers for desirable aspects of development which cannot be obtained by regulation, if the desired objectives are set out in the official plan. For example, bonus zoning could be used to obtain the construction of unusually energy-efficient buildings.

No date has yet been set for introduction of the proposed Act.

## 9.0 CONCLUSION

Ontario municipalities have numerous powers which can be used to increase the energy efficiency of their communities, both in existing areas and in new developments. Such powers could be an important element in a municipal energy efficiency program in Ontario.

The Ministry of Energy would welcome comments on the matters discussed in this paper.



## APPENDIX

A draft energy policy statement for possible inclusion in an official plan:

### General Policy Statement

The City of ..... affirms its commitment to the efficient supply and use of energy in the City, wherever possible.

Energy conservation and the increased use of renewable/recoverable energy will cushion the municipality, its residents and businesses from increases in the cost of fossil fuels, and will stimulate new energy-related industries. It is, therefore, the goal of Council to reduce the per capita rate of growth of consumption of electricity and non-renewable fuels to \_\_\_\_ per cent by 19\_\_.

In pursuing this goal, Council will

- a) use all reasonable and cost-effective opportunities to encourage the efficient use of energy, particularly in transportation, public services, and development;
- b) have due regard for other municipal policies and objectives;
- c) support and complement senior government policies and programs;
- d) encourage appropriate private sector activity; and
- e) actively seek the co-operation of the .... Hydro-Electric Commission and other individuals, groups, and organizations.

### Municipal Operations

Council will promote the efficient use of energy wherever possible in municipal operations, both to conserve non-renewable fuels itself, and to provide leadership for other energy consumers in the City. In particular, Council will, wherever technically and commercially feasible:

- a) consider energy recovery from municipal waste and sewage as an alternative to landfill;
- b) increase the energy efficiency of street lighting;
- c) reduce the consumption of non-renewable fuels in heating, lighting and cooling municipal buildings; and
- d) reduce the consumption of non-renewable fuels in municipal vehicles and other municipal operations.

Council will also initiate an effective energy data gathering, monitoring and evaluation system as a means of identifying opportunities and priorities for improving energy efficiency in municipal operations and in the community as a whole.

## Urban Form

Council will ensure that new development will make as efficient use as possible of energy from non-renewable sources and will contribute to improvement of the structure of the City from an energy conservation point of view.

In particular, Council will:

- (a) include an assessment of energy efficiency in the evaluation of development proposals;
- (b) encourage compact growth and infilling to reduce the energy used for space heating and transportation;
- (c) encourage mixed-use development to minimize the length of both work and non-work related trips, and to maximize the possibilities for the future development of district heating;
- (d) direct growth to areas which can best be served by fuel-efficient means of transportation, such as public transit and railways; and
- (e) maximize the access to sunlight of homes and other buildings at energy-efficient densities of development, for example, by laying out the majority of streets in an east-west direction and by orienting the majority of buildings within 30 degrees of due south, where terrain permits.

Council will also promote improvements in the energy efficiency of existing buildings. In particular, Council will:

- (a) initiate a retrofit program providing information and technical advice to building owners and operators;
- (b) monitor and evaluate the retrofit program at three-year intervals;
- (c) develop standards for the repair and maintenance of buildings in an energy-efficient manner, for example, by weatherizing external openings, such as doors and windows, by avoiding excessive mechanical heating, cooling and lighting, and by maintaining furnaces at a high level of efficiency; and
- (d) give favourable consideration to amendments and variances required to permit energy-conserving innovations.

## Transportation

Council will encourage reduction of the consumption of non-renewable transportation fuels. In particular, Council will:

- (a) improve the convenience and safety of alternatives to the private automobile, such as public transit, bicycles and car and van pools, for example, by establishing reserved lanes where appropriate; and
- (b) promote the energy-efficient transportation of goods, for example, by maximizing the use of rail and water where possible.

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